CLAIMS

1. A method of producing a metallic coating on an object (4) emerging from a bath of molten metal (5), in which a magnetic field is created near the exit point of the object, characterized in that the object leaves the bath of molten metal via an exit channel (3) containing a meniscus of the said bath of molten metal, and in that the thickness of the metallic coating is controlled as a function of a second derivative of the curve of the meniscus (6) and a capillary number Ca representing the ratio between the viscous forces of the molten metal and the forces of surface tension at the surface of the molten metal.

2. A method according to claim 1, characterized in that, during vertical drainage upwards, the exit channel (3) is dimensioned in such a way as to maintain the meniscus (6) of the molten metal in conditions close to capillary-gravitational equilibrium in the magnetic field, and in that the second derivative of the curve of the said meniscus (6) is a function of an electromagnetic forming parameter K representing the ratio between the forces of surface tension and the forces due to the effect of electromagnetic forming.

3. A method according to one of the preceding claims, characterized in that the exit channel is constructed in such a way that the annular gap is of the same order as the height of the meniscus, the annular gap being the distance between the inside wall of the exit channel and the metallic coating formed beyond the meniscus.

4. A method according to claim 1, characterized in that, during vertical drainage downwards, the second derivative of the curve of the said meniscus (6) is a function:

- of the ratio between the average thickness of the said object and the opening of the exit channel (3); and
- of the ratio between the Alfen rate and the rate of drainage of the said object.

5. A method according to one of the claims 1 and 4, characterized in that the exit channel is constructed so that the ratio between the average thickness of the said object and the opening of the exit channel (3) is greater than or equal to 0.8.

6. A method according to any one of the preceding claims, characterized in that the magnetic field is alternating and steady-state, and is created by means of a flat inductor (9).

7. A method according to any one of the preceding claims, characterized in that the magnetic field is created by means of an alternating current whose frequency is such that the ratio between the capillary length and the thickness of the magnetic skin in the metallic coating is greater than or equal to 3.

8. A method according to claim 1, for horizontal drainage with an exit channel containing a meniscus obtained by applying a sliding field in the bath of molten metal, characterized in that the second derivative of the curve of the said meniscus (6) is a function of a Bond number Bd representing the ratio between the forces of gravity and the forces of surface tension.

9. A method according to any one of the preceding claims, characterized in that means of exerting pressure on the molten metal are used for maintaining the height of the meniscus in the exit channel.

10. A method according to any one of the preceding claims, characterized in that means of electromagnetic pumping (16, 17) of the molten metal are used for maintaining the height of the meniscus in the exit channel.

11. A method according to any one of the preceding claims, characterized in that the object is a long and slender object with constant cross-section.

12. A device for producing a metallic coating on an object (4) emerging from a bath of molten metal (5), comprising means for creating a magnetic field near the point of exit of the said object, characterized in that it comprises an exit channel (3) containing a meniscus of the said bath of molten metal, and in that it additionally comprises means for adjusting the thickness of the metallic coating as a function of the second derivative of the curve of the meniscus (6) and of a capillary number Ca representing the ratio between the viscous forces of the molten metal and the forces of surface tension at the surface of the molten metal.

13. A device according to claim 12, characterized in that, in the case of vertical drainage upwards, the exit channel is such that the annular gap is of the same order as the height of the meniscus, the annular gap being the distance between the inside wall of the exit channel and the metallic coating formed beyond the meniscus.

14. A device according to claim 12, characterized in that, in the case of vertical drainage downwards, the exit channel is such that the ratio between

the average thickness of the said object and the opening of the exit channel (3) is greater than or equal to 0.8.

15. A device according to any one of the claims 12 to 14, characterized in that the magnetic field is alternating and steady-state, and the means for creating it include a flat inductor.

16. A device according to any one of the claims 12 to 15, characterized in that it comprises means for exerting pressure (2, 10) on the molten metal so as to maintain the height of the meniscus in the exit channel.

17. A device according to any one of the claims 12 to 16, characterized in that it comprises means for electromagnetic pumping (16, 17) of the molten metal so as to maintain the height of the meniscus in the exit channel.